For the estimation of fat in milk the Adam's method is recommended, viz., absorption of the milk by bibulous paper, drying, and extraction with ether. As alternate methods the procedure of Morse and Piggot or the lactocrite may be used. In the method of Morse the milk is dried by treatment with anhydrous sulphate of copper, and the fat extracted with light petroleum. Afterwards it is estimated volumetrically by saponification with standard alkali. In the method by the lactocrite the fat is separated in a centrifugal machine, revolving at the rate of 7,000 turns per minute, the milk being previously treated with an equal volume of a mixture of 1 part sulphuric and 20 parts acetic acid.

The method for analysis of fertilizers, with a few slight changes, remains as last year. The most important contribution in this matter was from Prof. M. A. Scovel of Kentucky, who showed that fertilizers containing nitrates could be treated by the Kjeldahl process, if the sulphuric acid used in digestion contained a certain portion of salycilic acid. By this means the total nitrogen existing in the three forms can be determined by an extremely simple and easy process.

The meeting was largely attended and full of practical interest from beginning to end. Two new committees, viz., one on fermented liquors and the other on sugar analysis, were appointed.

The following are the officers and committees for the coming year: President, Dr. P. E. Chazal; Vice-President, Dr. W. J. Gascoyne; Secretary, Mr. Clifford Richardson; Members of Executive Committee, Dr. E. H. Jenkins, Prof. J. A. Myers; Committees, on phosphoric acid, W. J. Gascoyne, N. W. Lord, W. E. Moses; on nitrogen, M. A. Scovel, N. T. Lupton, Wm. McMurtrie; on potash, J. A. Myers, Wm. Frear, E. H. Jenkins; on feeding-stuffs, G. C. Caldwell, W. H. Jordan, Clifford Richardson; on dairy products, H. W. Wiley, S. M. Babcock, H. P. Armsby; on fermented liquors, W. B. Rising, C. A. Crampton, G. F. Fellows; on sugar analysis, W. C. Stubbs, N. T. Lupton, H. W. Wiley.

ALASKA LETTER.

IT is strange that so little is known in the United States about Alaska. It has been a possession of our government for twenty years, and even now interest in it is only beginning to be developed. Yet in it we have by far the most remarkable of all our territories. Its area is not less than 600,000 square miles, or one-fifth of that of the United States proper. It is equal in extent to all the New England states, all the middle states, Ohio, Indiana, Michigan, the Virginias, the Carolinas, Tennessee, Kentucky, and Mississippi. Sitka is as far from the parallel of the extreme western boundary of Alaska as it is from the parallel of Eastport, Me. The present governor of the territory estimates its population to be 35,261, including whites, creoles, and natives. Of this number, 10,600, including 3,100 whites, dwell in south-eastern Alaska, the part accessible to tourists.

The native race of south-eastern Alaska is the Thlinket. The Thlinkets are far superior, intellectually and industrially, to the North American Indian. They are variously said to be of Asiatic and Aztec origin, but the majority of observers believe them to be related to the Chinese. They are skilful workers in wood and metals, shrewd traders, and very amenable to civilizing influences.

The climate of south-eastern Alaska is any thing but Arctic. The observations of Sergeant John J. McLean of the Signal Service at Sitka, for the year ending Aug. 31, 1886, showed an average temperature of 44°.8 F. The maximum was 72°, reached both in July and August, and the minimum 4°, reached in January. The rainfall is very heavy, often being more than 100 inches per annum.

Alaska's resources are timber, mining, furs, and fisheries, but as they are only just being measured, it is useless to quote figures concerning them.

The trip to Wrangell, Juneau, Sitka, and the great glaciers of south-eastern Alaska is now easily and quickly made by frequent steamers from the Puget Sound ports. During the summer season there are weekly sailings, and the fastest steamer makes the round trip from Tacoma, W.T., in eleven days. Travellers should provide themselves with warm clothing, for it will be needed during the entire trip. Rubber boots or overshoes, a rubber coat, and a stout pair of walking-boots are desirable. The last-mentioned are necessary for climbing on the Davidson and Muir glaciers, and the rubber articles are a protection against the wet weather.

For maps of the coast, the British Coast Survey maps are to be recommended, and the 'Coast Pilot' is a most valuable aid in determining the various peaks, glaciers, and channels. Though numerous books on Alaska have been issued, no one of them is satisfactory. Lieutenant Schwatka's book does not treat of south-eastern Alaska, and those that profess to do so are superficial and inexact. Hubert Howe Bancroft's 'History of Alaska' is important, but far from satisfactory.

Adequate educational provision for the native and white children has yet to made. The Thlinkets show great ability in industrial work, and it is a source of great satisfaction to hear that an organized course of industrial training is to be put in operation in the Sitka school at once. In the 'Circular of Information' of the Bureau of Education known as No. 2, 1882 will be found an interesting paper on 'The Neglect of Education in Alaska.' B. N.

Sitka, Alaska, Aug. 1.

HEALTH MATTERS.

AGAINST BERGEON'S TREATMENT. — Dr. Townsend and Dr. Hennessy report, in the *Albany Medical Annals*, nine cases of phthisis treated by gaseous enemata, after Bergeon's method. The reporters say that these cases, though few in number and somewhat incomplete, are deemed worthy of publication, as showing that this method of treatment seems as much of a failure in this dreaded malady as are others equally highly advocated at the present day. Besides these cases, four others have come under the observation of the writers, in three of which they personally superintended the administration of the gaseous enemata, the fourth being seen only once in consultation, but the records of which were accurately kept by the attending physician. With reference to all these cases, it is stated that after a fair trial of from two to four weeks it was deemed expedient and proper that it be discontinued for the two following reasons: first, it did no permanent — indeed it might almost safely be said not even transient — good; while, second, it was most disagreeable and annoying to the patients, who generally were the first to suggest, or even beg for, its withdrawal.

CHLOROFORMING WHILE ASLEEP. — In the August number of the *New Orleäns Medical and Surgical Journal* is an editorial comment on the subject of chloroforming persons while asleep. The editor says that there are several points relating to the physiological action of chloroform which have an important bearing on the question. The condition of health and the age of the person are matters to be considered in regard to the possibility of chloroforming people while asleep. To adults in perfect health chloroform is a decided cerebral stimulant, and it may be stated as a rule, to which the exceptions are exceedingly rare, that healthy adults cannot be chloroformed while asleep, unless their sleep has been induced by exhaustion or hypnotic agents. Weakly adults and children take chloroform with less resistance, as the stimulant effect on the cerebrum is less in degree and shorter in duration. Weakly adults and those acutely exhausted by disease or injury may be chloroformed during sleep. Children may also be chloroformed while asleep, and especially if they are depressed on any account. The editor recently demonstrated to several physicians the ease with which chloroform could be administered to a sleeping child when in a state of depression. The case was one of cancer of the mesentery, in which the little patient had been exhausted by pain and restlessness. The victims of chloroform at the hands of burglars are usually at the time in good health. The more improbable, then, is the story usually told of such burglaries. Under all conditions anæsthesia by chloroform can be accomplished during sleep only by skilful administration. Overdosage at the outset will certainly awaken the sleeper. The ability of burglars to force the anæsthesia of several persons sleeping in the same room without raising an alarm is to be doubted. In regard to the impression which prevails that burglars impregnate the air of an apartment with chloroform vapor, so as to gradually anæsthetize all the sleepers at the same time, the editor says that the weight of chloroform vapor and the readiness with which it descends make it difficult to saturate the air of a sleeping apartment, especially one

at the time well ventilated. Besides, the quantity of chloroform necessary to saturate the air sufficiently to produce anæsthesia is very considerable. Allowing one and a half grain of chloroform to the cubic inch of air, it would require thirty-eight fluid ounces to sufficiently impregnate the air of a room ten by twelve feet, with a ceiling eight feet high. It would certainly take a considerable time to vaporize this quantity of chloroform, to say nothing of the probability of awakening sleepers by any act of atomization, and even if it should succeed, what would be the effect on the burglars themselves?

MENTAL SCIENCE.

Why do we Sleep?

IN an address to the Anthropological Society of Brussels, Prof. Leo Errera has given a *résumé* of some points in the chemical theory of sleep. The phenomena of sleep have in common with other vital functions the character of periodicity. An examination of such periodic functions in general may aid in ascertaining the cause of sleep. The respiratory rhythm is regulated by the amount of oxygen and carbonic acid in the arterial blood. When the blood is charged with oxygen the respiratory centre momentarily suspends activity; but soon the tissues yield their oxygen to the blood, have it replaced by carbonic acid, and the blood thus modified acts as an excitant to the respiratory centre. Ranke has shown that the fatigue and recovery of muscles is due to a similar alternation of the accumulation and discharge of certain 'fatiguing substances,' chief amongst which is lactic acid. An injection of this acid into fresh muscle renders it incapable of work; washing the acid out restores the activity. Cannot sleep be explained by a similar chemical theory? Preyer has extended the views of Binz, Obersteiner, and others (who all agree in making the accumulation of certain products of fatigue — *ermüdungsstoffe* — the cause of sleep), by calling all such fatiguing products of activity 'ponogens.' These accumulate in waking life, are readily oxidizable, and absorb the oxygen intended for glands, muscles, and nerve-centres, until action is impossible and sleep sets in. Gradually the ponogens are destroyed by oxidation, slight excitation is sufficient to arouse the centres, and waking life begins. Amongst the ponogens, Preyer counts lactic acid as the chief, but the experimental demonstration of this has been unsuccessful, and the theory, accordingly, not generally adopted.

Since these researches Armand Gautier has found in the human body a series of five organic bases akin to creatine, creatinine, and xanthine, and calls them 'leucomäines' and 'ptomäines.' The physiological properties of these substances are narcotic, fatiguing, and sometimes lead to vomiting. This is just what the chemical theory requires. The periodicity of sleep would be explained by the conservation of energy being applicable to all bodily activity: work must be followed by repair; life is a slow suicide. There is, moreover, reason to believe that the action of these leucomaines is a direct one upon the brain; it is a direct intoxication of the brain-centres.

A theory of sleep must take account of three factors, work, fatigue, and sleep. The chemical theory satisfies these demands. All work, muscular or cerebral, produces waste products. These accumulate, make work more and more difficult: this is fatigue. As the process continues, the waste-products, notably the leucomaines, intoxicate the higher nerve-centres (just as a dose of morphine does), and render them incapable of action: that is sleep. The picture is, however, much more complex. There is a constant struggle against the fatigue, which for a time, by dint of hard work shown in increased secretions and so on, may succeed. We probably never arrive at the extreme limit of work; the sensation of fatigue intervenes to prevent such a disaster. Fatigue, as is well known, may extend from muscle to nerve, and from nerve to nerve-centre. We may be very tired from repeatedly lifting a weight, and not be sleepy, and may be generally sleepy without any considerable local fatigue. One is peripheral, the other central. As the waste products accumulate in the centres, motion and sensation become more and more sluggish until the time comes when the ordinary stimulation no longer arouses them, and we sleep. Partial sleep can be similarly explained. The centres go to sleep in a hierarchical order, the highest serving the most delicate function going first. In waking, the reverse is the case; the motor centres may be asleep while the intellectual centres are awake. In somnambulism the latter may be asleep while the former are awake.

The depth of sleep according to this theory ought to be proportional to the number of cortical molecules in combination with the leucomaines. In the beginning of sleep these are abundant, the cerebral cells inactive, and a combination easy. The sleep is deep. Soon the maximum number of combinations is reached, and sleep is deepest. From here on, the leucomaines are gradually eliminated and destroyed, and sleep should decrease with a decreasing intensity. Kohlschütter's experiments on the intensity of sleep, as tested by the noise necessary to awake the patient, gives the curve for the intensity of sleep corresponding to what we should expect by our theory. Variations in our sleep caused by an excess of work, etc., are evidently similarly explicable. In short, fatigue is a poison for which sleep is the normal antidote.

This theory maintains (1) that the activity of all the tissues (and primarily of the two most active, the nervous and muscular) gives rise to substances, more or less allied to alkaloids, the leucomaines; (2) that these induce fatigue and sleep; (3) that on waking, if the body is rested, these substances have disappeared.

To complete the demonstration of these statements much careful experimentation is necessary; but the facts as far as they go make it probable that the chemical theory of sleep will gain in strength as our knowledge advances.

ETHNOLOGICAL NOTES.

THE HAWAIIAN ISLANDS.—Dr. E. Arning's researches have been very successful. He was sent there by the curators of the Humboldt Fund at Berlin, in order to study leprosy, which has recently become the plague of the natives of this group. He stayed there for two and a half years, and during this time carefully collected relics of the ancient Hawaiian culture, and succeeded in bringing to light many points of interest, thus proving that European influence, which has swamped the islands since 1820, has not totally destroyed the remembrance of olden times. When the missionaries established their schools in Hawaii, the natives rapidly adopted European customs, burnt their temples and idols, and cast the stone images of their deities into the sea. The destruction was so complete that no traces seemed to remain. Arning, in studying the disease mentioned, had ample opportunities to come into contact with the natives in the remote villages of the islands, and here he found still many relics, and received information about the ancient arts and customs. His notes on the fishery of the Hawaiians are of interest. They were skilful divers, and used to frighten the fishes out of the caves and hollows of the rocky ground with sticks, and then catch them in nets. When fishing in the canoe, they used a sacred piece of heavy wood, called *melomelo*, which was kept in the sacred part of the hut, and was placed, with many ceremonies, in the canoe. It was attached to the net in order to attract the fish by its magic spells. A variety of hooks were used for different kinds of fish and according to the time of day, irisated shells being applied at noon and in a bright sun, while white ones served early in the morning and late in the evening. Arning describes their games, the wooden sledges on which they used to glide down the steep slopes of the mountains; the remarkable boards of koa-wood, shaped like an ironing board, standing on which they rode through the surf; the *moa*, a spindle-shaped piece of heavy wood, the use of which was allowed to the chiefs alone, who let it glide down the slope of a hill, at the foot of which it had to pass between two poles; and the famous game of *maika*, which is similar to the Italian 'boccia.' At the present time, when a powerful reaction against the missionaries is spreading all over the islands, the old *hula* dance has been revived, and the ancient dancing, ornaments, and musical instruments are used again. Arning describes a foot ornament made of 960 canine teeth of dogs, the work of several generations, — for dogs were slaughtered only at high festivals, — their drums, flutes, and xylophones. Arning's observations and collections form one of the most important recent contributions to Polynesian ethnology, and are the more valuable as they were made in a country which seemed to have lost all its originality by its rapid commercial development.